FOSSpicks

Sparkling gems and new releases from the world of Free and Open Source Software

Hunting snarks is for amateurs – **Ben Everard** spends his time in the long grass, stalking the hottest, free-est Linux software around.

Webmail client

Roundcube

There are email clients for just about every modern computer system, and most not-so-modern systems. Native email clients work well, but they can be fiddly to configure. This isn't a problem for a machine you use regularly, but if you only use a machine occasionally, it may not be worth it. The alternative is web-based email.

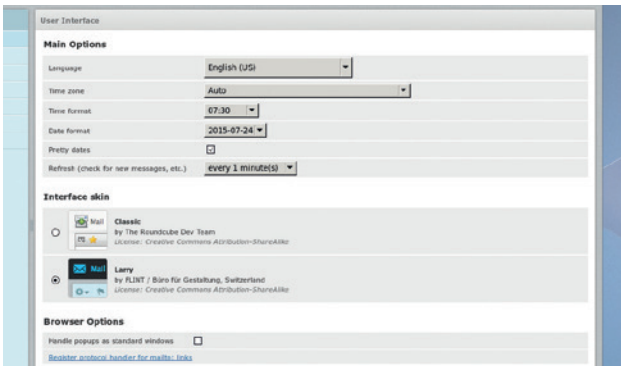
There are loads of services that will host email for you on a website (Gmail, Yahoo Mail, Hotmail, etc), but these are provided by companies that rely on advertising to make money, and we're not that comfortable allowing them access to all our communications.

To solve this conundrum, there's *Roundcube*, a webmail server that you host yourself. You just need to set it running on a machine with a publicly-routable IP address, and you can keep up with your emails from any machine. We like this solution so much, we use it for our Linux Voice email.

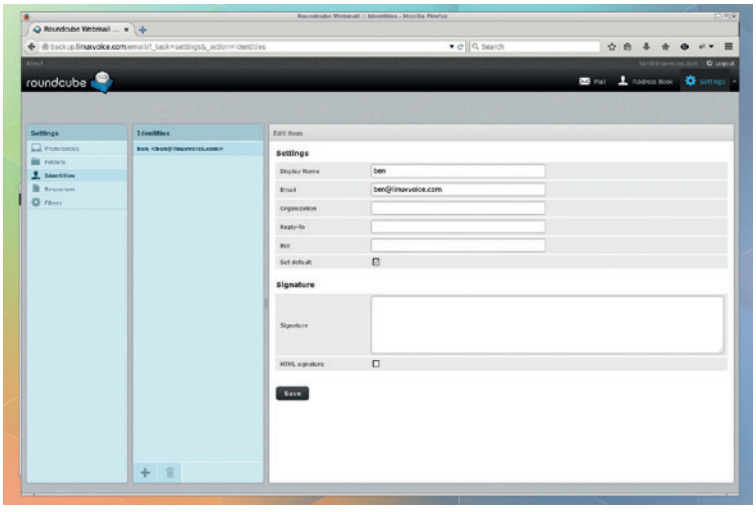
Roundcube is just an email client, so you need to pair it with the appropriate serv]ers for sending and receiving email. Just configure it as you would any desktop email client and you have a webmail system.

We've been running *Roundcube* for a little over a year, and haven't come across any major problems in that time. It's a little more limited than some native clients, but it does have an address book, filters for automatically sorting emails, and it handles HTML without any problems. The only key feature of an email client that's missing is PGP/GPG encryption. It is possible to do this with some external tool such as *Mailvelope* (**https://www.mailvelope.com**). In other words, there's nothing missing that we would consider essential in an email client, but power users may find things missing that they like. For example, there's only one type of flagging available.

"At Linux Voice we've been running Roundcube as our email client for a little over a year."



The settings in Roundcube are easy to understand and use.



Roundcube supports multiple sending identities allowing you to manage a range of accounts from a single login.

You can extend *Roundcube* with plugins, and you can see all those available at **http://plugins.roundcube.net**. You can also change the look of the interface through skins. We've never felt the need for either plugins or skins, but if you have a particular need in mind, it's worth checking to see if there are ways to meet this.

The new release brings a few minor improvements (better handling of HTML images and improved searching), but nothing that fundamentally alters this excellent software.

PROJECT WEBSITE
www.roundube.net

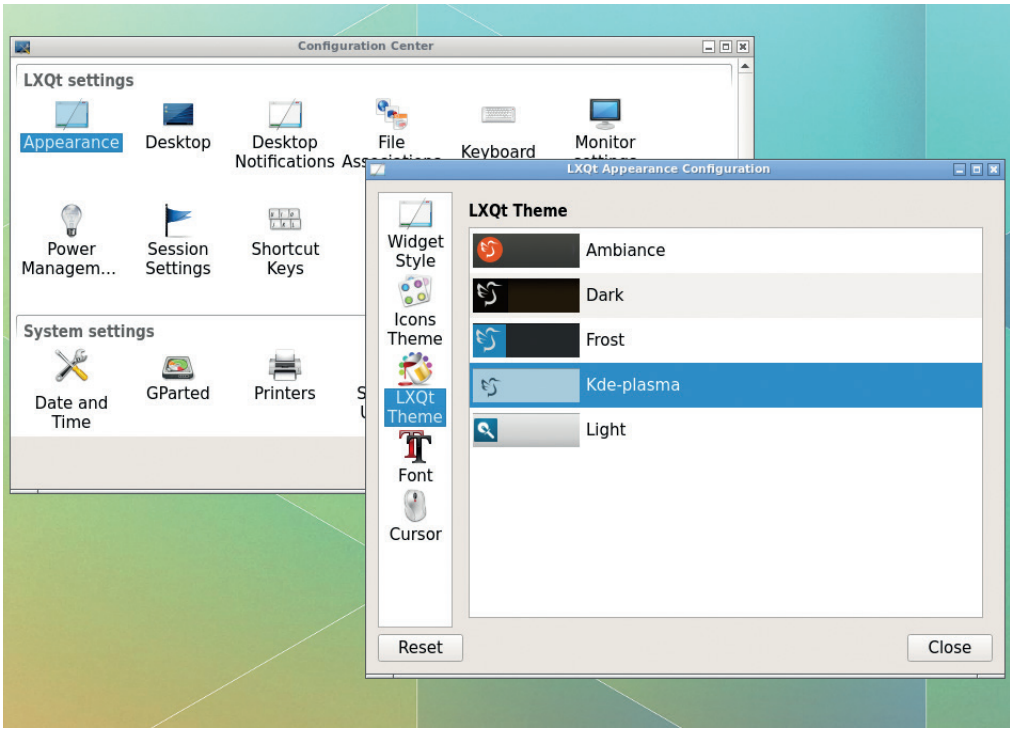
Lightweight desktop environment

LXQt

LXQt is a project created by the developers of the *LXDE* and *RazorQt* desktops coming together to create a new desktop environment based on the *Qt* widgets rather than the ones from *GTK* (as *LXDE* was). *LXQt*'s just reached version 0.9, so it's still in its infancy, but it's rapidly becoming a great option for low-power machines. The aim is to create a simple desktop that just works as users expect it to, rather than one full of configuration options for all kinds of features that few people will ever use.

Version 0.9 is fully migrated to the *Qt 5* toolkit (as used by the KDE desktop) and has dropped support for *Qt 4*, so it takes advantages of all the latest improvements in the platform. It also sees the inclusion of *KWindowSystem* and *KGuiAddons* from KDE. These reuse code from the other major *Qt* desktop rather than reimplementing the same functionality.

We've been using *LXQt* for the last couple of weeks, and we're impressed. It's fast, has what we need, and doesn't get in the way of normal computer use. We also haven't run into any stability problems, so despite its fairly young age, we can recommend it for general use. As a long-term *LXDE* user, this reviewer is considering making the switch permanent, and that's about the highest praise you can get from a software reviewer.

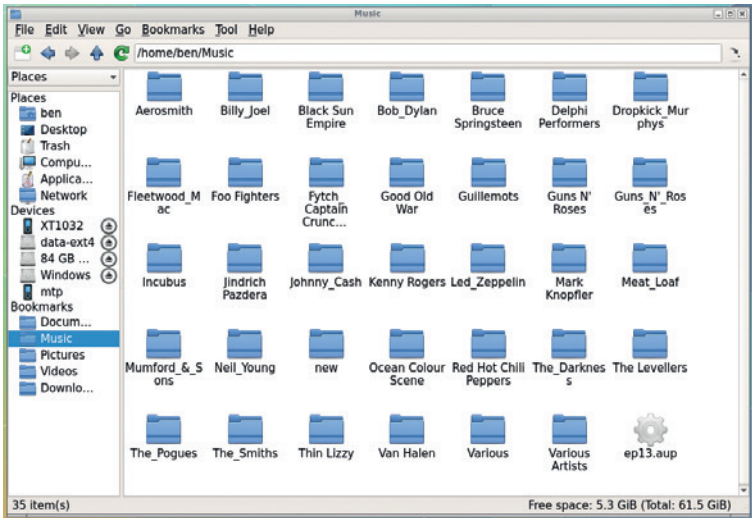


The new release of *LXQt* comes with the new Frost theme, and drops some old ones that weren't as popular.

While the desktop works well, don't expect too much in terms of software. You don't get much more than a desktop and a file manager with *LXQt*. The file manager – a *Qt* port of *PCManFM* – is about as minimalist as it's possible to be, and frankly, we'd prefer a little more functionality. Things like sorting lists of files by clicking on the column header rather than going into a menu, for example, would make the file manager much more pleasant to use.

"LXQt is fast, it has what we need, and it doesn't get in the way of normal computer use."

Much *Qt* software is designed to work with the much more heavyweight KDE desktop; conversely, a lot of the more lightweight Linux software uses the *GTK* widget set. This means that there's not a lot of software that fits the *LXQt* philosophy. This is sure to change though. In fact, it's already starting to: *QTerminal* is a lightweight terminal for *Qt* that fits in well with the *LXQt* philosophy. Watch this space...



PCManFM is too stripped down for our tastes – we prefer using a different file manager with *LXQt*.

PROJECT WEBSITE
www.lxqt.org

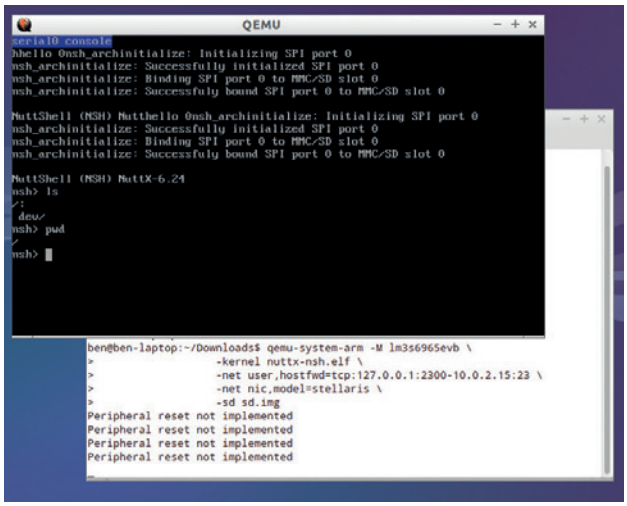
Real time OS

Nuttx

Compared to most modern operating systems, Linux is quite lightweight, and it happily runs on hardware that wouldn't even boot the latest version of Windows. However, sometimes even Linux is too heavy. Nuttx is a very lightweight real time operating system released under a BSD licence, and rather than more heavyweight options, it's designed with tiny processors in mind.

With a bit of persuading, it will run on a Z80 (the processor at the heart of the *Pacman* arcade machine, the Nintendo Game Boy, and many other iconic 80s and 90s computers), an AVR (similar to the chips in most of the Arduino microcontroller boards) and ARM Coretex-M series processors including the Arduino Due. If you like the sound of Nuttx, but don't have access to any of these bits of hardware, you can get started by emulating one using *Qemu*. There are instructions at **www.zilogic.com/blog/tutorial-nuttx.html**.

The point of Nuttx isn't to turn these machines into desktops, but for building embedded devices. As such, it's stripped down to just the barest essentials, but it still strives for Posix and ANSI compliance. It also has a few concessions to ease of use, such as a graphical widgets toolkit (*NxWidgets*) and a shell (*NuttShell*).



Nuttx boots to *NuttShell*, which accepts some of the same commands as a Linux system.

Real-time for hardware

This isn't something that you're going to replace your Linux install with, but if you're looking for a high degree of control over hardware, the real-time aspect of NuttOS is quite appealing, especially given that the real time patches for Linux are slowly sliding out of usability.

You won't find much in the way of drivers for consumer hardware, but there's support for peripherals such as USB hosts, flash memory, PWM drivers, CAN buses, DACs, ADCs, etc. If you're building your own hardware, this should be enough to run what you need.

PROJECT WEBSITE
www.nuttx.org

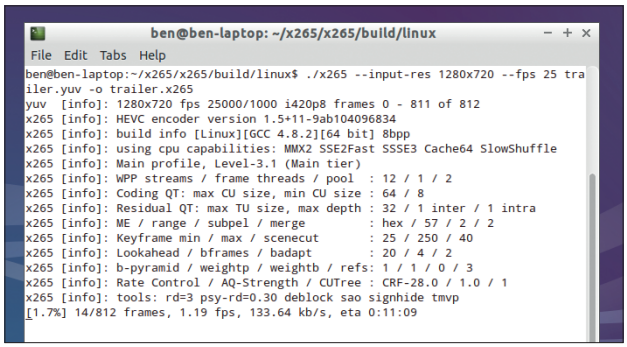
Video compressor

x265

Videos take up huge amounts of space and network bandwidth, and there's a constant effort to improve compression. Almost all video encoding – H.265 included – is lossy. This means you can make the file as small as you like, but as you make it smaller, the quality gets worse. The improved compression in this format means you can either store a video at the same quality in a smaller amount of disk space, or if you're not storing video but streaming it, you can stream higher quality over the same bandwidth or the same quality over a lower bandwidth.

x265 is an implementation of the new H.265 standard (also known as High Efficiency Video Coding or HEVC). This is the latest in a long line of standards from the Motion Pictures Expert Group (MPEG) and the International Telegraph Union (ITU). H.265 can roughly double the compression ratio of H.264 videos (also known and MPEG4 Part 10 or Advanced Video Coding).

It achieves the compression improvement using many optimisations, but one of the biggest is the use of coding tree units. All video compression splits each frame up into smaller sections and compresses them separately. Previous standards had split the image up into a regular grid, but HEVC varies the size of the sections it splits the image up into. Large sections are used to compress areas with little detail, while smaller areas hold more detail.


ben@ben-laptop: ~/x265/x265/build/linux
File Edit Tabs Help
ben@ben-laptop:~/x265/x265/build/linux$ ./x265 --input-res 1280x720 --fps 25 tra
iler.yuv -o trailer.x265
yuv [info]: 1280x720 fps 25000/1000 i420p8 frames 0 - 811 of 812
x265 [info]: HEVC encoder version 1.5+11-9ab104096834
x265 [info]: build info [Linux][GCC 4.8.2][64 bit] 8bpp
x265 [info]: using cpu capabilities: MMX2 SSE2Fast SSSE3 Cache64 SlowShuffle
x265 [info]: Main profile, Level-3.1 (Main tier)
x265 [info]: WPP streams / frame threads / pool : 12 / 1 / 2
x265 [info]: Coding QT: max CU size, min CU size : 64 / 8
x265 [info]: Residual QT: max TU size, max depth : 32 / 1 inter / 1 intra
x265 [info]: ME / range / subpel / merge : hex / 57 / 2 / 2
x265 [info]: Keyframe min / max / scenecut : 25 / 250 / 40
x265 [info]: Lookahead / bframes / badapt : 20 / 4 / 2
x265 [info]: b-pyramid / weightp / weightb / refs: 1 / 1 / 0 / 3
x265 [info]: Rate Control / AQ-Strength / CUTree : CRF-28.0 / 1.0 / 1
x265 [info]: tools: rd=3 psy-rd=0.30 deblock sao signhide tmvp
[1.7%] 14/812 frames, 1.19 fps, 133.64 kb/s, eta 0:11:09

The increased compression comes at the expense of slower processing. Our test machine could process just one frame per second.

"x265 improves compression using many optimisations."

x265 is open source, however it's not patent-free. This is a thorny subject, and if you're including x265 in any form of software, you should make sure you fully understand the situation. However, until Dalla – the patent-free codec developed by Mozilla and Xiph – is ready, there aren't any modern patent-free alternatives.

PROJECT WEBSITE
http://x265.org/

File manager

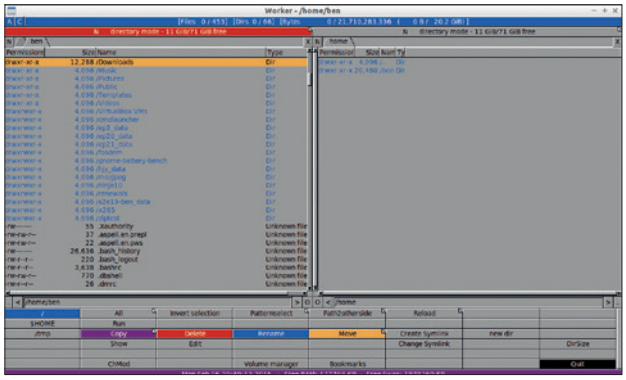
Worker

All desktop environments come with a file manager, but you may not always find that the default one meets all your needs.

Worker is a two-pane file manager. This style of file tool is less popular than it used to be, but still a very effective method of dealing with your files. Each pane is independent of the other, and you can browse different directories with each one. The big advantage of two-pane file managers is when you come to move files around. You can have one pane in the directory they're coming from, and the other in the directory they're going to, and then you can shuffle them around without the risk of them going missing. By far the most famous two-pane manager is *Midnight Commander*, which is a fantastically useful tool, but the terminal interface won't suit everyone. *Worker* brings the same level of power to the GUI world.

It's more than just two panes, though. It can also be used with AVFS (a virtual filesystem) to browse the contents of many compressed files. It has labels, bookmarks and a file search tool for finding what you need, and can use external programs to perform any missing functionality.

The look could either be described as retro or awful depending on your feelings about user interfaces. This look is due to it being built directly in X Windows and not using a widget toolkit. While this doesn't make for particularly stylish graphics, it does mean the code is very lightweight and extremely portable (if X runs on the system, then *Worker* will).



The garish colour scheme won't be for everyone, but at least it makes it easy to see what's going on.

"Worker's look could either be described as retro or awful."

The target user of two-pane file managers, unsurprisingly, is system administrators who deal with a lot of files, but they are useful for anyone who has to move loads of files from one place to another.

PROJECT WEBSITE
www.boomerangsworld.de/cms/worker

Exercise database

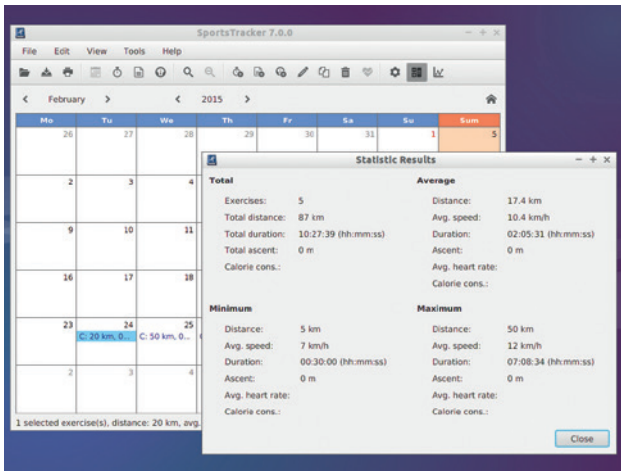
SportsTracker

There are plenty of free-to-use commercial tools for tracking how much exercise you're doing. However, this is one area that we think that free as in free software is really important. Not only is this key to health, but it's an area in which you'll build up a vast amount of data over the years. Commercial tools may monetise this data in various ways, and the companies that run them don't have your best interests at heart.

Plus, with a free (as in free software) tool, you know that you can get the data back if you need – although *SportsTracker* doesn't directly support exporting to formats suitable for other software, the open nature of the program means you can create a filter for the file format should you need to. Freedom aside, *SportsTracker* does its job well. It can import data from a wide variety of sources (including GPX, so you can get data from GPS receivers on mobile phones). It doesn't support a wide variety of sports types – just running and cycling – so depending on what you do, it may not be suitable for you. It also doesn't try to calculate the number of calories consumed, but the estimates that some applications make in this area are highly inaccurate anyway. As well as exercise, you can track your weight, so you can see if the workouts are having the desired effect, and you can plot how quickly you're losing weight.

Running free

SportsTracker 7 is newly re-written with a JavaFX interface (rather than Swing, which was used previously). It looks clean, and should run on anything with a Java runtime.



The statistics screen gives you an overview of the exercise you've been performing over any given timespan.

Commercial tools may have more functionality, but the knowledge that we're not entrusting our personal health data with third parties who are free to sell it on is a winning feature.

PROJECT WEBSITE
www.saring.de/sportstracker

Secure deleter

srm

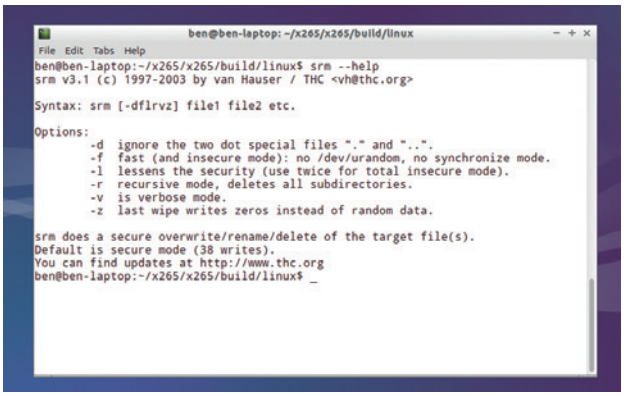
The **rm** (remove) command is probably one of the best known Linux tools. It's a simple command line utility that lets you delete files, and when combined with a powerful shell, it can be used to easily delete a range of files that satisfy particular criteria. However, it is badly named. It doesn't actually remove the files at all; it just deletes the reference to them. This means that if you delete a file using **rm**, the data is still there.

If you're just deleting a file to free up some space, then this isn't a problem. However, if you're deleting a file because it contains data you don't want to be on a machine any more, then **rm** isn't sufficient. You also need to remove the data.

Secure Remove (**srm**) is one solution to this. It's a drop-in replacement for **rm** that not only deletes the file in the same way **rm** does, but it scrubs off the data in a way that would please even the most paranoid people. First, it overwrites the data with all 1's. Then it overwrites it with random data – five times – then it overwrites that random data with special patterns that are designed to make it impossible to recover the data using even the most sophisticated theoretical recovery techniques – 27 times – then another five overwrites using random data. Only after all this overwriting does it consider the file blanked, and then it deletes the file.

The result is that there's no way that anyone – not even the most powerful state-sponsored attackers – can recover the data if the data's stored on a magnetic hard drive. Solid state drives can pose problems and are much harder to guarantee secure deletion. The downside of **srm** is that it takes longer to perform than normal **rm**. Large files can take several minutes to blank. That's the price of security.

"srm scrubs data in a way that would please even the paranoid."


ben@ben-laptop: ~/x265/x265/build/linux
File Edit Tabs Help
ben@ben-laptop:~/x265/x265/build/linux$ srm --help
srm v3.1 (c) 1997-2003 by van Hauser / THC <vh@thc.org>
Syntax: srm [-dflrvz] file1 file2 etc.
Options:
-d ignore the two dot special files "." and "..".
-f fast (and insecure mode): no /dev/urandom, no synchronize mode.
-l lessens the security (use twice for total insecure mode).
-r recursive mode, deletes all subdirectories.
-v is verbose mode.
-z last wipe writes zeros instead of random data.
srm does a secure overwrite/rename/delete of the target file(s).
Default is secure mode (38 writes).
You can find updates at http://www.thc.org
ben@ben-laptop:~/x265/x265/build/linux$

A full 38 wipes is probably overkill, but it's better to be safe when deleting sensitive data.

PROJECT WEBSITE
http://srm.sourceforge.net

Finance manager

HomeBank

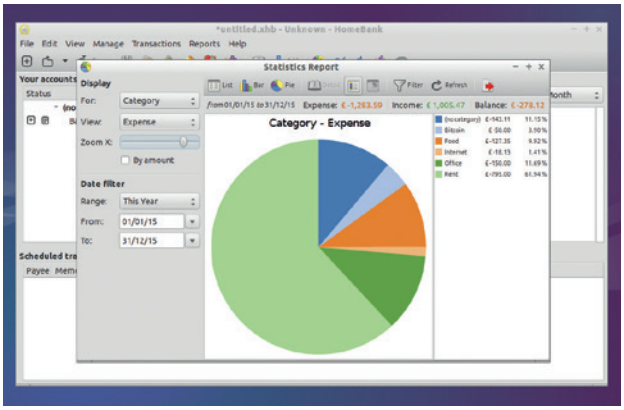
In today's world of online banking, where smartphone apps can tell you your bank balance, it's easy to keep track of how much money you have. However, it can be tricky to find out where all of your money is going. That's what *HomeBank* is for. It can import the QIF and OFX files used by online banks as an export format (note – QIF files didn't work in our testing, but this could have been a problem with our bank's export function). *HomeBank* then enables you to tag each transaction with what type it is. Using this, you can get a detailed picture of how much you spend on what.

You can take this simple method further by assigning a budget to each category of expense, and then see how you're performing with respect to these targets. You can then track these budgets over time, and make sure that you're realistic about your spending habits.

Annual expenditure £19 0s 6d

How well *HomeBank* will work for you will depend on how you spend money. If most of your expenses are on a card, then it's easy to import everything into the application. However, if most expenses are cash then they will each have to be created manually, and it might be easier to use a spreadsheet or some other custom tool. We found that we could go from an exported file from the bank to a detailed breakdown of expenditure very quickly.

Finance software can sometimes be intimidating, but *HomeBank* is easy to use, even for people new to finance. You don't need to know any fancy jargon, or wade through archaic forms. It all just works as expected. Should you find yourself stuck though, *HomeBank* is well documented at **http://homebank.free.fr/help/index.html**. If you're unsure where your salary goes at the end of each month, then this is the software for you.



HomeBank can display data in pie, bar and line charts, giving you three ways to view the vultures pecking at your hard-earned money.

PROJECT WEBSITE
http://homebank.free.fr

FOSSPICKS Brain Relaxers

Ball balancing challenge

Neverball

Using the mouse or keyboard, you control the tilt of a board. On that board is a ball, and you have to use the tilt to manoeuvre the ball around various mazes, collecting coins as you go, until you reach the finish. It sounds simple, and in many ways it is. The enemy here isn't complex AI, or other players, but simple physics. The faster you move through the maze, the more momentum the ball has, and the harder it is to control. Slow and steady or fast and reckless – which is better? We chose the latter option, but then here at Linux Voice Towers, we're used to life on the edge.

This game doesn't stand out only for its gameplay though. It's also the first desktop Linux app to work with Gnome's sandboxing applications project. This project uses a group of nifty technologies to package applications up in such a way that they are distro-independent, and can be limited in how they interact with the system in order to improve security. This is similar to how apps work on Android. There's a blog post by Alexander Larson about the process of sandboxing *NeverBall* at **http://blogs.gnome.org/alexl/2015/02/17/first-fully-sandboxed-linux-desktop-app**.

It's early days for sandboxing on Linux (at least, non-Android Linux), so we can't say for sure how well it will end up, but we're cautiously optimistic about the potential for more secure and portable (between distributions) packaging. The early indications are that it will make it far easier to release software for Linux, and that's got to be a good thing. In the mean time, you should also find *Neverball* as a regular package in your distro's repositories.

The 3D graphics are simple enough to run on most computers, but rich enough to provide an immersive experience.

PROJECT WEBSITE
http://neverball.org

Transport simulator

OpenTTD 1.5

OpenTTD is based on the classic 90s game *Transport Tycoon Delux*. The aim is to build a thriving, transport business by connecting a map with transport links, and plying the routes with vehicles.

The gameplay is a little confusing to start with, so it's probably best to start with the tutorials at **http://wiki.openttd.org/Tutorial**, especially if you're not familiar with the original game. This will take you through building the infrastructure, buying vehicles, and putting them to work on routes. All this is needed before you can start to make money off your fledgling transport empire. Once you've learned the basics, the learning curve gets a bit shallower, and it's easy to progress through the game using more and more advanced transport options without resorting to the documentation too much.

OpenTTD contains a number of improvements including larger maps, an online multiplayer mode and more advanced transport options. These make the game far richer and allow enjoyment for longer than the original.

Despite all the enhancements, *OpenTTD* is true to the spirit of the original, both in gameplay and in style. The isometric view and pixellated graphics will provide a welcome dose of nostalgia to anyone who enjoyed PC gaming in the 90s. Play it on a CRT screen, put some Oasis or Blur on the stereo and hunker down for some retro fun.

"OpenTTD's improvements make it far richer than the original."

You can use land, sea and air to move cargo and people as efficiently – and as cost-effectively – as you like.

PROJECT WEBSITE
www.openttd.org